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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **3BM-ARC1419/Renewal**

September 2, 2014

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Nunavut X0A 0A0
Email: sao_ab@qiniq.com

Bhabesh Roy, M.A. Sc., P. Eng
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Baffin Region, Government of Nunavut
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RE: NWB Renewal Licence No. 3BM-ARC1419

Dear Mr. Qamanirq and Mr. Roy:

Please find attached Licence No. **3BM-ARC1419** issued to the Hamlet of Arctic Bay by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (Nunavut Land Claims Agreement or NLCA)*. The terms and conditions of the attached Licence related to water use and waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then the use of Water and deposit of waste must cease, or the Licensee may be in contravention of the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least **three (3) months** prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public's interest, to hold a public hearing. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment; however, a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and are acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received by interested

persons on issues identified. This information is attached for your consideration.¹

Sincerely,



Thomas Kabloona
Nunavut Water Board
Chair

TK/sj/pb

Enclosure: Renewal Licence No. **3BM-ARC1419**
 Comments – AANDC

Cc: Qikiqtani Distribution List

¹ Aboriginal Affairs and Northern Development Canada (AANDC), June 11, 2014.

TABLE OF CONTENTS

I.	BACKGROUND	ii
II.	FILE HISTORY	ii
III.	APPLICATION PROCEDURAL HISTORY	ii
IV	ISSUES.....	iii
	DECISION.....	viii
	WATER LICENCE RENEWAL.....	1
	PART A: SCOPE, DEFINITIONS AND ENFORCEMENT	2
	1. Scope	2
	2. Definitions.....	2
	3. Enforcement	5
	PART B: GENERAL CONDITIONS	5
	PART C: CONDITIONS APPLYING TO WATER USE	8
	PART D: CONDITIONS APPLYING TO WASTE DISPOSAL	8
	PART E: CONDITIONS APPLYING TO MODIFICATION AND ONSTRUCTION.....	9
	PART F: CONDITIONS APPLYING TO DRILLING OPERATION AND MAINTENANCE	10
	PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION	12
	PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM.....	13

I. BACKGROUND

The Hamlet of Arctic Bay (Hamlet or Licensee) is located on Borden Peninsula, Baffin Island, Nunavut. The community is surrounded by steep hills and sits mostly on a low gravel beach on the shore of Arctic Bay, off of Adams Sound.

Approximately 766 (2013) people reside in Arctic Bay; the hamlet is responsible for supplying the potable water required and managing waste generated by the community. Potable water required, and solid waste and sewage generated by the community are transported to/or from the community to the respective treatment/management facilities by means of trucks.

II. FILE HISTORY

The NWB issued to the Hamlet of Arctic Bay, on November 1, 2002, a five (5) year licence, NWB3ARC0207, for a municipal undertaking that included but was not limited to the use of 45,000 cubic metres of water annually and the deposit of waste generated by the Hamlet.

On March 2, 2005, the NWB amended (Amendment No.1) Licence NWB3ARC0207 to allow for emergency remedial work to be conducted that was aimed at minimizing potential failure of the containment berms associated with the Sewage Disposal Facility. Licence NWB3ARC0207 expired on October 31, 2007.

On March 17, 2008, a two (2) year renewal licence, 3BM-ARC0810 (NWB3ARC0810), was issued with an expiry date of March 31, 2010. The licence allowed for the use of 45, 000 cubic metres of water annually and the continued deposit of waste in support of municipal undertakings and activities conducted in the Hamlet of Arctic Bay.

Amendment No.1 to Licence 3BM-ARC0810 was issued on April 16, 2009 to allow for the construction of a new sewage lagoon, a gravel access road linking the existing lagoon to the new sewage lagoon, decommissioning of the existing Sewage Disposal Facility, release of effluent from the new sewage lagoon, and for quarrying activities.

III. APPLICATION PROCEDURAL HISTORY

On March 22, 2010, the NWB received from GN-GCS, on behalf of the Hamlet of Arctic Bay (The Hamlet or The Licensee) an application and supporting documents for the renewal of Licence 3BM-ARC0810. Following receipt, the NWB conducted an internal review of the Application, which identified specific deficiencies that had to be addressed in order for the Application to proceed through the licensing process. The NWB provided details of its findings to the proponent in correspondence¹ dated June 24, 2010.

On March 27, 2014, the NWB received from GN-CGS, on behalf of the Hamlet of Arctic Bay, an application to renew water Licence 3BM-ARC0810. Following receipt, the NWB conducted a preliminary review of the application, which identified deficiencies that the Licensee needed to address prior to the NWB being able to process the Application. The Licensee was informed of the NWB's findings in correspondence² from the Board dated, May 1, 2014.

In response to the NWB's correspondence, the proponent provided, on May 3, 2014, copies of new or revised documents to address the identified deficiencies. The proponent also included

¹ Letter from D. Hohnstein, NWB, to B. Roy, GN-CGS, and J. Qamanirq, Hamlet of Arctic Bay, Re: Renewal Application for Water Licence 3BM-ARC0810, June 24, 2010.

² Email from S. Joseph, NWB, to B. Roy, GN-CGS, Re: 3BM-ARC0810 Renewal – Preliminary Technical Review, May 1, 2014

revisions to the scope of the application to include an amendment to specific licence terms and conditions. Having determined the submission to address the relevant deficiencies satisfactorily, the NWB distributed the Application for a thirty (30) day public review period on May 12, 2014. The application to renew and amend Licence 3BM-ARC0810 includes the following documents:

- Appendix A – New Application form signed by SAO, dated March 17, 2014
- Appendix B – Design Brief for New Sewage Lagoon
- Appendix C – O&M manual for the new sewage lagoon
- Appendix D – Design for Abandonment and Restoration of old lagoon
- Appendix E – Geothermal report of the old lagoon
- Appendix F – Annual Reports for 2011, 2012, 2013 with Lab results
- Appendix G – Technical Summary of the Environmental Facilities in English and Inuktitut
- Appendix H – Authorization Letter from the Hamlet

On or before the deadline for comments, the NWB received a submission from Aboriginal Affairs and Northern Development Canada (AANDC).

IV ISSUES

The following sections provide background information relevant to terms and conditions included in this Licence in the context of submissions received and/or the Board's rationale. It should be noted that under this renewal-amendment Licence, 3BM-ARC1419, the Board has removed or modified, where appropriate, terms and conditions associated with the previous licence that have been amended under this renewal licence.

Licence Scope

The scope of the application is for the renewal-amendment of Licence 3BM-ARC0810 to allow for the continued use of Water and deposit of waste in support of a Municipal undertaking. The term requested for the renewal-amendment licence is ten (10) years. The amendment aspect of the application targets the removal of specific conditions from the Licence.

Amendment Request

The Licensee requested in its Application the removal of terms and conditions related to Part D, Items 6a and 6b from licence 3AM-ARC0810. These conditions require the licensee to demonstrate, through laboratory analyses, that effluent from the Wetland Treatment Area, Final Discharge Point is not acutely toxic. Rationale provided by the Licensee for the requested amendment includes logistical and sampling timeline constraints that make it difficult for the licensee to submit samples to the lab on time. The NWB is well aware of the constraints identified by the Licensee in terms of transporting samples required to conduct analyses under Part D, Items 6a and 6b of the expired licence. As the location of Arctic Bay poses a particular challenge to getting samples in question to a southern laboratory in a timely manner to support defensible results, the NWB has decided to remove the requested terms and conditions; however, the Licensee should understand that the requirement associated with the terms and conditions removed could be activated at the discretion of an Inspector.

Term of the Licence

The Licensee has requested a ten (10) year term for the renewal-amendment licence. In accordance with s. 45 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSTRA or the Act), the NWB may issue a licence for a term not exceeding twenty-five (25) years. In determining an appropriate term for the renewal-amendment licence, the Board took into consideration several factors including intervener's comments, the Licensee's compliance history, and rationale included in the Application. Aboriginal Affairs and Northern Development (AANDC) recommended in its review comments that consideration be given to a term of five (5) instead of ten (10) for any potential licence issued to the project.

Given the Licensee's ongoing compliance disposition, the Board had contemplated issuing a licence for a term even shorter than five (5) years; however, the Board has decided to issue the licence for a five (5) year term, which the Board believes will provide the Hamlet with ample time and opportunity to address all non-compliance issues associated with its undertaking and as articulated in the Plan for Compliance accompanying the Application. The Board expects and requires all non-compliance issues mentioned in the Application to be addressed prior to the expiry of the licence.

Further, the five (5) year term assigned to the licence will provide stakeholders and the Board with an opportunity to continue to examine the overall performance of the licensee over time and prior to considering any future renewal licence that might include a longer term.

The Licensee should note that if it is determined that it is necessary to renew or amend the Licence, the application for such a renewal or amendment should be filed at least **three (3) months** prior to the Licence expiry date so as to allow adequate time for the Board to complete the renewal process before the licence expires.

Annual Reports

Under the reporting section of the Licence, Part B, Item 1, the Licensee is required to submit, on an annual basis, a report that pertains to the use of Water and the deposit of waste. This information is kept in the NWB's public registry and made available to interested persons upon request. In addition, the NWB maintains annual reporting information on its FTP site, which can be accessed using the following link (username: **public** and password: **registry**): <ftp://ftp.nwb-oen.ca/1%20PRUC%20PUBLIC%20REGISTRY/>

The Board notes that there have been instances where the Licensee had failed to submit, on time, copies of documents pertaining to annual reporting requirements. The Board would like to take this opportunity to remind the Licensee that the annual reporting requirements of the licence should be adhered to at all times so as to help maintain full compliance with respective terms and conditions in the licence.

Compliance Plan

As part of its renewal-amendment application, the Licensee submitted a Plan for Compliance that describes how the Licensee intends to address outstanding requirements under the expired licence. While the Board recognizes that the compliance plan is a living document that would require continual updates overtime, the Board does have concerns about the lack of exact timelines as well as significant uncertainties inherent in many of the commitments included in the compliance plan. The Board notes that a compliance plan is not and should be interpreted as a mechanism by which a licensee is allowed to delay addressing any requirements of a licence. The revised compliance plan submitted with the application has been accepted by the

Board, under Part A, Item 3d in the licence rather than being approved to minimize potential or perceived risk to the Board.

Water Use

The Hamlet of Arctic Bay obtains all of its fresh water from a natural lake called Marcil Lake, located approximately 8 kilometers east of the Hamlet. The water is pumped from the lake to the treatment plant and is then distributed by trucks to residents in the community. The Licensee has requested the use of approximately 50,005 cubic metres of freshwater annually or 137 cubic metres of fresh water daily for all purposes under the licence. The Board has received no objections from interveners with respect to the quantity of water requested.

Based on the nature of the undertaking and water supply needs of the Hamlet, the NWB has granted the quantity of water requested by the Hamlet and set the maximum water use for all purposes under this Licence at 50,005 cubic metres *per* year or no more than 299 cubic metres per day, to allow for some flexibility, under Part C, Item 2 in the licence. If the licensee requires water in quantities greater than that allowed under the licence or from sources other than Marcil Lake, the Licensee will be required to submit an amendment application to the Board for consideration.

Waste Deposit

Details included in the application indicate that the undertaking is expected to generate the following waste types: Sewage and greywater, Non-hazardous Solid Waste, Hazardous Waste, Bulky Items/Scrap metal, animal waste, waste oil, sludge and contaminated soil. The following facilities have been developed to handle the waste generated by the Hamlet:

Sewage Treatment Facility

The Hamlet uses a single cell, sewage lagoon system to treat sewage generated by the community. The lagoon system, which was constructed in 2013 and has a projected lifespan of 20 years, is complemented by a wetland area (a vegetative filter-strip) that is used to polish water treated from the sewage lagoon system. The previous lagoon system, which was constructed in 1976 and expanded in 2003, was decommissioned in 2013 in accordance with information contained in the report entitled *Arctic Bay Sewage Lagoon Decommission*, dated April 2008, and as required in the expired licence. Further, the report entitled, *Geothermal Analysis of Abandonment Sewage Lagoon*, dated September 28, 2012 and required under the expired licence, was reviewed with the issuance of this licence.

All sewage generated by the community is collected and transported by trucks to the new sewage lagoon system for treatment. Conditions have been included under Part D, Item 1 in the licence to allow the deposit of all sewage generated by the hamlet at the Waste Water Treatment Facility.

Sludge Removal

Information included in the renewal-amendment application indicates that sludge removal may not be required throughout the lifespan of the Waste Water Treatment Facility; however, operational conditions will determine whether any sludge removal activities will be undertaken during the lifespan of the facility. Accordingly, conditions have been included under Part H, Item 7 in the licence requiring the Licensee to measure quantity and analyze the quality of sludge generated by the Waste Water Treatment Facility in accordance with details contained in the respective operations and maintenance manual.

Solid Waste

The Hamlet operates a non-engineered landfill facility for the purposes of treating domestic waste and bulky metal waste. Although sparse details have been provided in the application with respect to the operations of this facility, some information included in the application suggests that the Licensee is contemplating constructing a new solid waste facility and that once the facility is constructed, the Licensee will be prepared to submit the relevant operations and maintenance manual. While the Board agrees that an Operations and Maintenance (O&M) manual will be required for the new facility once constructed, an O&M manual for the existing Solid Waste Disposal Facility is required to assist the proponent in managing any non-hazardous and hazardous waste generated by the Hamlet in accordance with requirements in the licence and applicable regulations. The Board has therefore included conditions under Part F, Item 2 in the Licence, requiring the submission of an O&M Manual for the existing Solid Waste Disposal Facility within ninety (90) days from the date of issuance of this licence.

Design Drawings

The Licensee has submitted the following as-built, design drawings for facilities and/infrastructure associated with the scope of the expired and/or current licence:

- Arctic Bay Wastewater Lagoon – Overall Site Plan (OSP-1)
- Arctic Bay Wastewater Lagoon – Existing Site (ES-1)
- Arctic Bay Wastewater Lagoon – Location Plan for Truck Discharge and Decanting (TD-1)
- Arctic Bay Wastewater Lagoon – Details (DE-1, DE-2)
- Arctic Bay Wastewater Lagoon – Signage Location Plan (SLP-1)
- Arctic Bay Wastewater Lagoon Road – Site Plan (SP1)
- Arctic Bay Wastewater Lagoon – Cross Sections (CS-1)
- Arctic Bay Wastewater Lagoon – Proposed Lagoon (L-1)
- Arctic Bay Wastewater Lagoon, Access Road – Plan and Profile (PP1, PP2, PP3, PP4, PP5, PP6, PP7)
- Arctic Bay Waste water Lagoon –Road Details (DE-1)

The licensee should note that the above-mentioned as-built, design drawings must be signed and stamped by an Engineer licensed to practice in Nunavut in order to be accepted by the Board.

Operation and Maintenance Manuals

As part of the documents accompanying the renewal application, the Licensee included the following operations and maintenance manuals:

- *Arctic Bay TruckFill, Arctic Bay, NT, Operations and Maintenance Manual* (Vol. 1 &2), dated June 1998.
- *Arctic Bay Waste Water Facility, Arctic Bay, Nunavut, Operations and Maintenance Manual Volume 1&2*, date June 2012.

The NWB has conducted separate reviews for each of the above-mentioned documents. The review conducted on the Operations and Maintenance (O&M) Manual for the Truck Fill station determined that, while the manual is reasonably functional, it is not specific to the Hamlet of Arctic Bay Truckfill Station, and it contains a sizable amount of outdated information in addition. The Board has therefore included conditions, under Part F, Item 3, in the licence,

requiring the licensee to update the O&M manual and resubmit it to the Board for approval within ninety (90) days from the date of issuance of this Licence.

With respect to the O&M Manual for the Waste Water Treatment Facility, the Board has approved, under Part F, Item 1, the version of the plan submitted with the Application as the NWB's review determined that the document is complete and functional. The Licensee should note however, that the O&M manual required under the expired licence was meant to address all of the facilities under the scope of the expired licence. Given that this O&M Manual is generally specific to the Waste Water Treatment Facility and does not necessarily apply to the other facilities operated by the Hamlet, the Board has decided to approve the manual for the Waste Water Treatment Facility. However, terms and conditions have been included in the Licence, under Part F, Items 2 and 3, requiring submission to the Board for review and approval, an updated O&M for the Water Supply Facility or Truck-fill Station and an O&M Manual for the Solid Waste Disposal Facility.

Monitoring

In the Quality Assurance/Quality Control (QA/QC) plan included in the Operations and Maintenance Manual for the Waste Water Treatment Facility, the Licensee made several changes to Monitoring Station Identification (ID). While it is not customary for the Board to change Monitoring Station IDs in response to a plan submitted after the station IDs have been established in previous licences for the same undertaking, the NWB has amended the monitoring station IDs to reflect details provided in the QA/QC plan, as shown under Part H, Item 1 in the Licence. Further the amendment issued to the licence on April 16, 2009 indicated that Monitoring Station IDs ARC-3, ARC-4, and ARC-5, will not be required once the old Sewage Disposal Facility is decommissioned. Information included in the renewal-amendment application indicated that the old sewage lagoon has been decommissioned; however, details included in sections 4.2 and 4.3 of the Operations and Maintenance Manual for the new Waste Water Treatment Facility confirms that the following Monitoring Stations IDs are now associated with the Waste Water Treatment Facilities: ARC-3, ARC-4, ARC 6a, and ARC-6b, ARC-7, and ARC-8, with some of the IDs being reused, where appropriate, for the Waste Water Treatment Facilities. The NWB has further modified, where possible, Part H, Item 1 to ensure consistency in the names given to monitoring stations.

DECISION

LICENCE NUMBER: 3BM-ARC1419

This is the decision of the Nunavut Water Board (NWB) with respect to a complete application received May 3, 2014 for the renewal-amendment of a Water Licence made by:

HAMLET OF ARCTIC BAY

to allow for the use of water and deposit of waste for a Municipal undertaking that includes the operation of Water Supply Facility, Waste Water Treatment Facility, and a Solid Waste Disposal Facility at the Hamlet of Arctic Bay, which is located within the Qikiqtani Region, Nunavut at the following general geographical coordinates:

Latitude: 73° 02' N Longitude: 83° 05' W (Project Extents)

DECISION

After having been satisfied that the application was in conformity with the North Baffin Regional Land Use Plan³ as determined by the Nunavut Planning Commission (NPC) and exempt from the requirement for screening as described within Schedule 12-1 by the Nunavut Impact Review Board⁴ in accordance with Article 12 of the *Nunavut Land Claim Agreement (NLCA)*, the NWB decided that the application could proceed through the regulatory process. In accordance with s.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (Act)* and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representation made by the interested party, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the *NLCA* and of the *Act*, waived the requirement to hold a public hearing, and determined that:

Licence No. 3BM-ARC0810 be renewed as Licence No. 3BM-ARC1419 subject to the terms and conditions contained therein. (Motion #: 2014-B1-026)

Signed this 29th day of August 2014 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board, Chair

TK/sj/pb

³ Nunavut Planning Commission (NPC) Conformity Determination, August 20, 2014.

⁴ Nunavut Impact Review Board (NIRB) Screen Exemption Decision, May 26, 2014.



**NUNAVUT WATER BOARD
WATER LICENCE RENEWAL**

Licence No. 3BM-ARC1419

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

HAMLET OF ARCTIC BAY

(Licensee)

P.O. BOX 150 ARCTIC BAY, NUNAVUT X0A 0A0

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence renewal:

Licence Number/Type: **3BM-ARC1419 TYPE "B"**

Water Management Area: **WESTERN BRODEUR PENINSULA WATERSHED (46)**

Location: **HAMLET OF ARCTIC BAY
QIKIQTANI REGION, NUNAVUT**

Classification: **MUNICIPAL UNDERTAKING**

Purpose: **DIRECT USE OF WATER AND DEPOSIT OF WASTE**

Quantity of Water use not
to Exceed: **50,005 CUBIC METRES PER ANNUM OR 299 CUBIC
METRES PER DAY**

Date of Licence Issuance: **AUGUST 29, 2014**

Expiry of Licence: **AUGUST 28, 2019**

This Licence renewal and amendment, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

**Thomas Kabloona,
Nunavut Water Board, Chair**

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the use of water and the deposit of waste for a Municipal undertaking classified as per Schedule 1 of the *Regulations* at the Hamlet of Arctic Bay, which is located within the Qikiqani Region, Nunavut.

- a. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new Regulations are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and
- b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

In this Licence **3BM-ARC1419**

“**Act**” means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“**Addendum**” means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report;

“**Amendment**” means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

“**Analyst**” means an Analyst designated by the Minister under Section 85 (1) of the *Act*;

“**Application**” means the complete amendment-renewal application and supporting documents filed with the NWB by the Government of Nunavut –Community Government Services (GN-CGS) on behalf of Hamlet of Arctic Bay and on May 3, 2014;

“**Appurtenant Undertaking**” means an undertaking in relation to which a use of water or a deposit of waste is permitted by a licence issued by the Board;

“**Board**” means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“**Dam Safety Guidelines**” means the *Canadian Dam Association (CDA) Dam Safety Guidelines (DSG)*, January 1999 or subsequent approved editions;

“**Decommissioned Sewage Lagoon**” means the single-cell lagoon, ice pack storage area and associated wetlands located approximately 2 kilometres east of the Hamlet. The lagoon was constructed in 1976, expanded in 2003 and decommissioned.;

“**Effluent**” means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond, landfarm or a treatment plant;

“**Engineer**” means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2* and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

“**Final Discharge Point**” in respect of an effluent means an identifiable discharge point of a facility beyond which the operator of the facility no longer exercises control over the quality of the effluent;

“**Freeboard**” means the vertical distance between water line and the designed maximum operating height on the crest of a dam or dyke’s upstream slope;

“**Geotechnical Engineer**” means a professional engineer registered with the Association of Professional Engineers, Geologist and Geophysicists of Nunavut and whose principal field of specialization with the engineering properties of earth materials in dealing with man-made structures and earthworks that will be built on a site. These can include shallow and deep foundations, retaining walls, dams, and embankment;

“**Grab Sample**” means a single water or wastewater sample taken at a time and place representative of the total discharge;

“**Greywater**” means all liquid wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet wastes;

“**High Water Mark**” means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities);

“**Inspector**” means an Inspector designated by the Minister under Section 85 (1) of the *Act*;

“**Licensee**” means the holder of this Licence;

“Modification” means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

“Monitoring Program” means a monitoring program established to collect data on surface water and groundwater quality to assess impacts to the freshwater aquatic environment of an appurtenant undertaking;

“Nunavut Land Claims Agreement (NLCA)” means the *“Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada”*, including its preamble and schedules, and any amendments to that agreement made pursuant to it;

“Regulations” means the *Nunavut Waters Regulations* SOR/2013-69 18th April, 2013;

“Sewage” means all toilet wastes and greywater;

“Solid Waste Disposal Facility” means the facilities designated for the disposal of solid waste, as described in the Applications for Water Licence filed by the Licensee on July 18, 2002 and on May 3, 2014;

“Spill Contingency Plan” means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

“Sump or Sumps” A structure or depression that collects, controls, and filters liquid waste before it is released to the environment. This structure should be designed to prevent erosion while allowing percolation of liquid waste;

“Vegetated Filter Strip Wetland Area” comprises approximately 11.2 hectares of land immediately downstream of the sewage lagoon, for approximately 700 metres at a slope of 6 to 13% and includes the lagoon dewatering pump and infrastructure as described in the Application for Water Licence Amendment filed by the Applicant on April 30, 2008 and application filed on May 3, 2014, and illustrated in construction drawings prepared by Trow Associates Inc. Project OTCD00019054A;

“Waste” means, as defined in s.4 of the *Act*, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means;

“Waste Disposal Facilities” means all facilities designated for the disposal of waste, and includes the Sewage Disposal Facility, the Waste Water Treatment Facility, and the Solid Waste Disposal Facility, as described in the Application for water licence renewal filed by the Applicant on October 9, 2007 including supporting documents, and as

described in the Application for Water Licence Amendment filed by the Applicant on April 30, 2008 and May 3, 2014;

“Waste Water Treatment Facility” comprises the engineered single cell sewage lagoon and decant structures designed to contain and treat sewage as described in the Application for Water Licence Amendment filed by the Applicant on April 30, 2008 and the complete renewal-amendment application filed on May 3, 2014 and illustrated in construction drawings prepared by Trow Associates Inc. Project OTCD00019054A;

“Water” or “Waters” means waters as defined in section 4 of the Act;

“Water Supply Facility” means the intake infrastructure and appurtenances used to transmit, store and distribute water for the community of Arctic Bay as described in the complete application received on May 3, 2014.

3. **Enforcement**

- a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;
- b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and
- c. For the purpose of enforcing this Licence and with respect to the use of Water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law;
- d. The Board has accepted the revised Plan for Compliance submitted as additional information with the Application. Any updates or revisions to the Plan for Compliance must be submitted to the Board for review and acceptance within thirty (30) days from the date on which the updates or revisions have been made.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report with the Board, no later than March 31 of the year following the calendar year reported, which shall contain the following information:
 - a. tabular summaries of all data generated under the “Monitoring Program”, including an interpretation and discussion of wastewater treatment levels of the Waste Water Treatment Facility as well as the treatment efficiency of the Vegetated Filter Strip Wetland Area;
 - b. modifications to the Monitoring Program in accordance with Part H, Item 15;

- c. the annual quantity in cubic metres or tonnes of any sludge removed from the Waste Water Treatment Facility along with the treatment/storage/disposal provided;
 - d. the results of sampling and analyses of any sewage sludge, if removed from the Waste Water Treatment Facility, in accordance with Part H, Item 7;
 - e. an assessment of the geotechnical and geothermal performance of the Waste Water Treatment Facility including an analyses of the results from the thermistor, standpipe and settlement monitoring stations, as required in Part H Item 11;
 - f. the monthly and annual quantities in cubic metres of fresh water obtained from all sources;
 - g. the monthly and annual quantities in cubic metres of each and all waste discharged;
 - h. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
 - i. a list of unauthorized discharges and summary of follow-up action taken;
 - j. any updates or revisions for manuals and plans (i.e., Operations and Maintenance Manuals) as required by changes in operation and/or technology;
 - k. detailed minutes of any public consultation and participation with local organizations and the residents of the community regarding licence amendments;
 - l. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the following year;
 - m. a summary of any studies, reports, and plans (e.g., Operations and Maintenance, Abandonment and Restoration, Quality Assurance/ Quality Control Plans) requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned; and
 - n. any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.
2. The Licensee shall comply with the “Monitoring Program” described in this Licence, and any amendments to the “Monitoring Program” as may be made from time to time, pursuant to the conditions of this Licence.
 3. The “Monitoring Program” and compliance dates specified in the Licence may be modified at the discretion of the Board.
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4. Meters, devices, or other such methods used for measuring the volumes of water used and waste discharged shall be installed, operated and maintained by the Licensee.
 5. The Licensee shall, within ninety (90) days after the first visit by the Inspector, following issuance of this Licence, post the necessary signs to identify the stations of the "Monitoring Program." All signage postings shall be in the Official Languages of Nunavut.
 7. The Licensee shall ensure a copy of this Licence is maintained at the Municipal Office at all times. Any communication with respect to this Licence shall be made in writing to the attention of:
 - (a) **Manager of Licensing:**
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca
 - (b) **Inspector Contact:**
Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445
 8. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.
 9. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the NWB is received and acknowledged by the Manager of Licensing.
 10. The Licensee shall, for all Plans, Manuals, and Reports submitted under this Licence, include a proposed timetable for implementation. Plans, Manuals, and Reports submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan or Manual if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.
 11. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and condition imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.
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12. This Licence is assignable as provided for in Section 44 of the *Act*.
13. The Licensee shall, for all Plans and/or manuals submitted under this Licence, implement the Plans and/or manuals as approved by the Board.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain, from Marcil Lake, all potable water required for the Water Supply Facility and relevant uses included under the scope of this licence.
2. The annual quantity of water use for all purposes under this Licence shall not exceed 50,005 cubic metres or the daily quantity of water use for all purposes under this Licence shall not exceed 299 cubic metres.
3. The Licensee shall equip all water intake hoses with a screen of an appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.
4. The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless otherwise approved by the Board in writing.
5. The Licensee shall not cause erosion to the banks of any body of Water and shall provide necessary controls to prevent such erosion.
6. Sediment and erosion control measures shall be implemented prior to and maintained during the operation to prevent entry of sediment into water.
3. All activities shall be conducted in such a way as to minimize impacts on surface drainage, and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all municipal Sewage generated by the Hamlet of Arctic Bay to the Waste Water Treatment Facility, or as otherwise approved by the Board in writing.
2. The Licensee shall provide notice to an Inspector at least ten (10) days prior to initiating any decant of the Waste Water Treatment Facility.
3. All Effluent discharged from the Waste Water Treatment Facility at Monitoring Program Station ARC-4 shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration
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	of any Grab Sample
BOD ₅	120 mg/L
Total Suspended Solid	180 mg/L
Fecal Coliform	1x 10 ⁶ CFU/100mL
Oil and Grease	No visible sheen
pH	between 6 and 9

4. The Licensee shall maintain at all times, a freeboard of at least 1.0 metre, or as recommended by a Geotechnical Engineer and as approved by the Board, for all dams, dykes or other structures intended to contain, withhold, divert or retain water or wastes.
5. The Waste Water Treatment Facility shall be maintained and operated, to the satisfaction of an Inspector and in such a manner as to prevent structural failure.
6. The Licensee shall dispose of and contain all solid wastes generated by activities and undertakings under this Licence at the Solid Waste Disposal Facility or as otherwise approved by the Board in writing.
7. The Licensee shall segregate and store all hazardous materials and/or hazardous waste within the Solid Waste Disposal Facility and in such a manner as to prevent the deposit of deleterious substances into any Water and until such time that proper disposal arrangements are made.
8. The Licensee shall implement measures to control wind-blown litter at the Solid Waste Disposal Facility in compliance with Part D, Item 7.
9. The Licensee shall, for the construction, operation and maintenance activities, use material free of contaminants, obtained from an approved source, and that have been demonstrated to not possess acid generating and metal leaching properties.
10. The Licensee shall ensure that sediment and erosion control measures are implemented prior to and maintained during activities carried out under this Part to prevent the release of sediment and minimize erosion.
11. The construction or disturbance of any stream/lake bed or the banks of any definable watercourse are not permitted unless authorization is obtained from the Department of Fisheries and Oceans Canada (DFO).

PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval, design drawings stamped by an Engineer registered in Nunavut, prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or waste.

2. The Licensee may, without written approval from the Board, carry out modifications to the Water Supply and Waste Disposal Facilities provided that such modifications are consistent with the terms of this Licence and the following requirements are met:
 - i. the Licensee has notified the Board in writing of such proposed modifications at least sixty (60) days prior to beginning the modifications;
 - ii. these modifications do not place the Licensee in contravention of the Licence or the Act;
 - iii. the Board has not, during the sixty (60) days following notification of the proposed modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
 - iv. the Board has not rejected the proposed modifications.
4. Modifications for which all of the conditions referred to in Part E, Item 2, have not been met, may be carried out only with written approval from the Board. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Board has approved the Manual entitled *Arctic Bay Waste Water Facility Operations and Maintenance Manual Volumes 1 & 2*, dated July 2012, submitted as additional information with the renewal-amendment Application.
 2. The Licensee shall submit to the Board for approval in writing, within ninety (90) days from the date of issuance of this Licence, an Operations and Maintenance Manual for the existing Solid Waste Management Facility, prepared where appropriate, in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories; 1996*. This Manual shall include but not be limited to the following:
 - a. Solid Waste Operation and Maintenance Plan;
 - b. Hazardous Waste Management Plan;
 - c. Spill Contingency Plan including a Spill Response Plan that addresses potential spills associated with the solid waste facility;
 - d. Monitoring Program Quality Assurance/Quality Control Plan including a
 - e. diagram that references Monitoring Program Station Numbers; and
 - f. Instrumentation Monitoring and Surveillance Plan.
 3. The Licensee shall submit to the Board for approval in writing, within ninety (90) days from the date of issuance of this Licence, an updated Operations and Maintenance Manual for the Water Supply Facility or Truck-fill Station. This updated Manual shall include but not be limited to the following:
 - a. Information specifically related to the Hamlet of Arctic Bay Water Supply Facility
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- while excluding information related to the Hamlet of Clyde River;
 - b. Removal of all references related to the Northwest Territories;
 - c. Spill Contingency Plan including a Spill Response Plan for chemicals used and stored at the facility;
 - d. Monitoring Program Quality Assurance/Quality Control Plan including a diagram that references Monitoring Program Station Numbers; and
 - e. Instrumentation Monitoring and Surveillance Plan
4. The Licensee shall review the Manuals and Plans referred to in this Part as required by changes in operation and/or technology and modify accordingly. Revisions are to be submitted in the form of an Addendum to be included with the Annual Report, unless directed otherwise by the Board or an Inspector.
 5. An inspection of all engineered facilities related to the management of water and waste shall be carried out at least annually, in July or August, by a municipal Engineer. The Engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.
 6. An inspection of all engineered facilities shall be conducted, during the summer period, by a Geotechnical Engineer in accordance with the *Canadian Dam Safety Guidelines* Facility, at least one (1) year prior to the expiry of the Licence. The Geotechnical Engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.
 7. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.
 8. If, during the period of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a. employ the appropriate contingency measures as approved under the appropriate Operation and Maintenance Manual for the Hamlet of Arctic Bay;
 - b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130, to the Inspector at (867) 975-4295, and to the Government of Nunavut, Department of Environment at (867) 975-7700; and
 - c. submit to the Inspector, a detailed report on each occurrence, within thirty (30) days after initially reporting the event, that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.
 9. The Licensee shall, in addition to Part F, Item 8, regardless of the quantity of releases of harmful substances, report to the NWT/NU Spill Line if the release is near or into a Water body.
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10. The Licensee shall maintain an undisturbed buffer zone of at least one hundred (100) metres between any proposed quarry operation and the normal High Water Mark of any water body.
11. The Licensee shall implement sediment and erosion control measures prior to and during activities carried out under this Part to prevent the release of sediment and minimize erosion.
12. If water is encountered during any permafrost excavation which requires pumping, the Licensee shall locate the discharge for the pumped water above the High Water Mark of any water body.

PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval in writing, an Abandonment and Restoration Plan at least six (6) months prior to abandoning any facilities or upon submission of the final design drawings for the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:
 - a. Water intake facilities;
 - b. Sewage Disposal Facility, Water Supply Facilities and Waste Disposal Facilities;
 - c. Petroleum and chemical storage areas;
 - d. Any site affected by waste spills;
 - e. Leachate prevention;
 - f. An implementation schedule;
 - g. Maps delineating all disturbed areas, and site facilities;
 - h. Stream crossings;
 - i. Consideration of altered drainage patterns;
 - j. Type and source of cover materials;
 - k. Future use of affected area;
 - l. Hazardous wastes; and
 - m. A proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.
2. The Licensee shall practice progressive reclamation of the abandoned quarry in accordance with the restoration guidelines outlined in Indian and Northern Affairs Canada's document entitled *Environmental Guidelines for Pits and Quarries*, (2010).
3. For site reclamation purposes, the Licensee shall salvage topsoil during any construction activities, for future restoration of the site to promote re-vegetation.

PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall maintain Monitoring Program Stations at the following locations and implement the following Program:

Monitoring Station ID	Description	Frequency	Status
ARC-1	Raw Water intake at Marcil Lake	<u>Volume</u> Monthly and Annually	Active (Volume)
ARC-2	Raw Sewage from pump out truck	N/A	Inactive
ARC-3	Raw Wastewater Discharge (South Berm)	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Three (3) times annually (once at the onset of decant; once during decant; and once at the end of decant)	Active (Volume, Water Quality)
ARC-4	Lagoon Pump Discharge (North Berm)	<u>Water Quality</u> Three (3) times annually (once at the onset of decant; once during decant; and once at the end of decant)	Active (Volume, Water Quality)
ARC-5	Ocean water five (5) metres from point where Effluent enters the ocean from existing Sewage Disposal Facility	<u>Water Quality</u> Three (3) times annually (once at the onset of decant; once during decant; and once at the end of decant)	Inactive
ARC-6a	Sampling Well at end of Wetlands	<u>Water Quality</u> Three (3) times annually (once at the onset of decant; once during decant; and once at the end of decant)	Active (Water Quality)
ARC 6b	Surface water at the end of Wetland area	<u>Water Quality</u> Three (3) times annually	Active (Water Quality)

		(once at the onset of decant; once during decant; and once at the end of decant)	
ARC-7	Water five(5) metres from effluent Waste Water Treatment Facility entering Victor Bay	<u>Water Quality</u> Three (3) times annually (once at the onset of decant; once during decant; and once at the end of decant)	Active (Water Quality)
ARC-7b	Runoff from the Quarry Site	<u>Water Quality</u> Annually during periods of runoff or seepage	Active (Water quality)
ARC-8	Sewage Sludge	TBD	Active (Volume, quality)
ARC-9	Run-off from the Solid Waste Disposal Facility	<u>Water Quality</u> Annually during periods of runoff or seepage	Active (Water Quality)
ARC-10	Thermistors in accordance with approved instrumentation Monitoring and Surveillance Plan as required in	TBD	(Temperature
ARC-11	Standpipes in accordance with approved Instrumentation Monitoring and Surveillance Plan as required in	TBD	(Seepage)
ARC-12	Settlement stations in accordance with approved Instrumentation Monitoring and Surveillance Plan as required in	TBD	(Location, Elevation)

2. The Licensee shall sample water quality at Monitoring Program Stations ARC-3, ARC-4, ARC-6a, ARC-6b, and ARC-7 three (3) times annually (once at the onset of decant;

once mid-way during decant; and once near completion of decant). Samples shall be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD ₅	Faecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	Total Phenols
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc
Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)

3. The Licencee shall sample at Monitoring Program Stations ARC-7b and ARC-9 annually during periods of runoff or seepage. Samples shall be analyzed for the following parameters:

TPH (Total Petroleum Hydrocarbons)	
PAH (Polycyclic Aromatic Hydrocarbons)	
BTEX (Benzene, Toluene, Ethylbenzene, Xylene)	
BOD ₅	Faecal Coliforms
pH	Conductivity
Total Suspended Solids	Oil and Grease
Nitrate-Nitrite	Ammonia Nitrogen
Total Phenols	Total Alkalinity
Total Hardness	Calcium
Magnesium	Potassium
Sodium	Sulphate
Total Arsenic	Total Cadmium
Total Copper	Total Chromium
Total Iron	Total Lead
Total Mercury	Total Mercury

4. The Licensee shall measure and record, in cubic metres, the monthly and annual quantities of water pumped at Monitoring Program Station ARC-1, for all purposes.
5. The Licensee shall measure and record, in cubic metres, the monthly and annual quantities of raw sewage offloaded from trucks at Monitoring Program Station ARC-2, for all purposes.

6. The Licensee shall measure and record in cubic metres, the monthly and annual quantities of effluent pumped from Monitoring Program ARC-4.
7. The Licensee shall sample and analyze the quality and measure the quantity any sludge removed from the Waste Water Treatment Facility in accordance with procedures developed for the approved Operations and Maintenance Plan referred to in Part F, Item 1. The results shall be reported within the Annual Report as per Part B Item 1.
8. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board.
9. All analyses shall be performed by a laboratory certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL), or as otherwise approved by an Analyst.
10. The Licensee shall submit to the Board upon approval by an Analyst, for inclusion in the Operations and Maintenance Manuals required under Part F Item 2(d) and Item 3(d), respective Quality Assurance/ Quality Control Plans. The Plans shall include up-to-date sampling methods to all applicable standards, acceptable to an accredited laboratory as required by Part H, Items 8 and 9. The Plans shall include a cover letter from the accredited laboratory and Analyst, confirming acceptance of the Plan for analyses to be performed under this Licence.
11. The Licensee shall submit to the Board, as part of the Annual Report required under Part B, Item 1, monitoring results for thermistor, standpipe, and settlement stations at monitoring stations ARC-10, ARC-11, and ARC-12. An annual assessment of the geotechnical and geothermal performance of the Waste Water Treatment Facility shall be provided as an addendum to the Annual Report required as per Part B Item 1. This assessment shall include:
 - i. an interpretation of unexpected monitoring results;
 - ii. an analyses of settlement station results on liner integrity; and
 - iii. an analyses of thermistor and seepage results on berm stability.
12. The detailed Instrumentation Monitoring and Surveillance Plans referred to in Part F, Item 2(f), and Part F, Item 3(e) shall include the following where applicable:
 - i. Details of the proposed instrumentation plan, the frequency of measurements and trigger values or observations for remedial action;
 - ii. A review of geothermal monitoring plans including the number of thermistors to be installed, the location of thermistor installations, the installation of thermistors within the key trench, the depth of thermistor strings in subgrade soils, justification for the final chosen depth of thermistor strings, and the final detailed design of thermistor strings, taking into consideration reviewer comments; and

- iii. Details of settlement monitoring at the upstream and downstream toes of the berms.
- 13. The Licensee shall confirm the locations and GPS coordinates for all monitoring stations referred to in Part H Item 1 with an Inspector.
- 14. Additional monitoring stations, sampling and analysis may be requested by an Inspector.
- 15. The Licensee shall include all of the data and information required by the Monitoring Program as well as an indication of wastewater treatment levels and water quality upstream and downstream of the Vegetated Filter Strip Wetland Area, within the Licensee's annual report, as required under Part B Item 1, or as requested by an Inspector.
- 16. Modifications to the Monitoring Program may be made only upon written approval from the Board. Requests for changes to the Monitoring Program should be forwarded to the NWB in writing, and should include the justification and appropriate evidence to support the request.